

CLAIMS

1. A polymer actuator which comprises a plurality of gel/electrode complexes arranged in an electrolytic solution, said gel/electrode complex being composed of a polymer gel containing acidic or basic functional groups and electrodes placed in the polymer gel, such that it changes in volume upon application of a voltage across said electrodes.

2. The polymer actuator as defined in Claim 1, wherein the electrolytic solution changes in pH value in the vicinity of the gel/electrode complexes upon voltage application across the electrodes, and the gel/electrode complexes change in volume in response to the pH change.

3. The polymer actuator as defined in Claim 1, which comprises more than one unit of the gel/electrode complex composed of a polymer gel having acidic functional groups and more than one unit of the gel/electrode complex composed of a polymer gel having basic functional groups.

4. The polymer actuator as defined in Claim 1, wherein the polymer gel constituting the gel/electrode complex contains a polymer having acidic functional groups and basic functional groups.

5. The polymer actuator as defined in Claim 1, wherein the polymer gel constituting the gel/electrode complex contains a mixture of polymers each having acidic functional groups and basic functional groups.

6. The polymer actuator as defined in Claim 1,

wherein the gel/electrode complexes are arranged parallel to each other.

7. The polymer actuator as defined in Claim 1, wherein the gel/electrode complexes are arranged in a container which is filled with said electrolytic solution and said container has electrodes projecting from its both ends.

8. The polymer actuator as defined in Claim 7, wherein the container is flexible enough to follow the volume change of the gel/electrode complex.

9. The polymer actuator as defined in Claim 1, wherein the polymer gel is a polymeric hydrogel and the electrolytic solution is an electrolytic aqueous solution.

10. The polymer actuator as defined in Claim 1, wherein the electrode constituting the gel/electrode complex is a coiled metal wire or a metal mesh.

11. The polymer actuator as defined in Claim 1, wherein the electrode constituting the gel/electrode complex is an electrically conductive granular or fibrous substance mixed with or dispersed in the polymer gel.

12. The polymer actuator as defined in Claim 1, wherein the electrode constituting the gel/electrode complex is composed of a coiled metal wire or a metal mesh and an electrically conductive granular or fibrous substance.

13. The polymer actuator as defined in Claim 1, wherein the electrode is made of at least one species of gold, platinum, palladium, amorphous carbon, and graphite.